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ABSTRACT

Through a review of the training of medical professionals, similarities can be identified as well as interesting possibilities for the preparation of education professionals. Described is a medical school curriculum over its 4-year duration. The first year's focus is basic science; the second year's is clinical introduction, and the final 2 years are clerkship years. The instruction provided during these curriculum phases and student evaluation of them are outlined. Three general principles of the curriculum are stated: the core of the method is problem solving, an emphasis is on continuous or continuing medical education, and learning should happen on the job. By looking at the more generic view of the medical school curriculum, the format reveals a heavy content or didactic emphasis in the first year. In the second year it becomes half didactic and half clinical. During the final 2 clerkship years the emphasis is on clinical experience. The professional programs of the medical and education students are then compared. One critical difference noted between clinical experiences is the lack of contact that beginning educators have with excellent role models. The characteristics of each profession are compared to understand how the concept of a profession is viewed in each field. Implications for the training of educators are outlined. (10 references) (RR)

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THE MEDICAL MODEL AND THE PREPARATION
OF EDUCATION PROFESSIONALS

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THE MEDICAL MODEL AND THE PREPARATION OF EDUCATION PROFESSIONALS

By reviewing the training of medical professionals, one can identify similarities as well as interesting possibilities for the preparation of education professionals. On a very basic level, the fields of medicine and education hold the following in common:

- Both fields are practice-oriented.
- Both fields require individuals with problem-solving and decision-making skills.
- Interpersonal relationship skills are a requisite for success in either field.
- Information in both fields multiplies daily.
- Lectures alone cannot convey the skills required for success in these fields.

A Medical School Curriculum

In order to point to the similarities and possibilities, it is necessary to briefly outline a medical school curriculum¹ and discuss some of its significant aspects. Table 1 identifies the four years of medical school as M-1, M-2, M-3, and M-4. The steps in the curriculum are also referred to as Phase I, Phase II, Phase III and Phase IV. These terms permit a more detailed explanation of the M-2 year. A third way to describe the steps in the program is to refer to the Basic Science year, the Clinical Introduction year and finally, the two Clerkship years. These three methods of defining progress in this medical school curriculum are used interchangeably.

M-1 Year

The M-1 year consists of a number of courses indicated under Basic Science. These courses are taught either in large lecture halls or in a laboratory depending on the content being presented. A unique feature of this year is the M.D.A. program. The M.D.A. is the Medical Doctor Advisor. Each student is assigned to an M.D. for advising. This experience is the student's first formal exposure to the practice of medicine. The student and the M.D. arrange the amount and level of involvement of the student. This is the "hands-on" or practice-oriented portion of the first year. The practice-related portion of the M-1 year is minute when compared with the lecture-laboratory experiences.

The student, in the M-1 year, is evaluated using several measures. Level III exams are available to students via the PLATO (Lyman, 1981) instructional computer system. Although the student is required to take these exams, the exams are used solely for diagnostic purposes. Laboratory skills examinations are given in conjunction with the laboratory courses. Comprehensive examinations are administered twice a year. Students must pass the comprehensive examinations before they can proceed to the M-2 year.

M-2 Year

The M-2 year can be referred to as the bridge between the basic sciences and the clinical years. The curriculum reflects this transition, too. Phase II refers to the beginning weeks of the M-2 year. The number of weeks devoted to Phase II activities has varied throughout the history of the program. Eight weeks can serve as an average for discussion purposes. The M-2 year activities are divided between morning and

¹The medical school curriculum described here is that of the University of Illinois College of Medicine at Urbana-Champaign. This College of Medicine is of recent genesis (1970) and its curriculum continues to be refined to accommodate the needs of the students and faculty. Therefore, the model described is not a static one.

Table 1

MEDICAL SCHOOL CURRICULUM

	M-1 PHASE I	M-2 PHASE II	M-2 PHASE III	M-3 PHASE IV	M-4
	BASIC SCIENCE	CLINICAL INTRODUCTION		CLERKSHIPS	
I N S T R U C T I O N	GROSS ANATOMY I & II EMBRYOLOGY I & II HISTOLOGY I & II PHYSIOLOGY I & II MICROBIOLOGY I & II BEHAVIORAL SCIENCE IMMUNOLOGY BIOCHEMISTRY MEDICAL STATISTICS MEDICAL GENETICS NEUROSCIENCE NUTRITION PATHOLOGY	EPIDEMIOLOGY STATISTICS	PATHOPHYSIOLOGY PATHOLOGY PHARMACOLOGY SOCIOMEDICINE EPIDEMIOLOGY	REQUIRED CORE: INTERNAL MEDICINE SURGERY PEDIATRICS OBSTETRICS GYNECOLOGY PSYCHIATRY	SELECTIVES: PRIMARY CARE SURGICAL SUBSPECIALTY ELECTIVES: ORTHOPEDICS NEUROSURGERY ENT COLON-RECTAL SURGERY ANESTHESIOLOGY OPHTHALMOLOGY PLASTIC SURGERY UROLOGY
	M.D.A.	DATA BASE	DATA BASE TUTORIALS		
S T U D E N T E V A L U A T I O N	STUDENT EVALUATION	STUDENT EVALUATION		STUDENT EVALUATION	
	LEVEL III EXAMINATIONS	WRITTEN EXAM		COLLEGE OF MEDICINE SENIOR CERTIFYING EXAMINATION	
	LABORATORY SKILLS EXAMS			INDIVIDUAL STUDY PROJECT	
	BASIC SCIENCE COMPRE- HENSIVE EXAMINATIONS: PART I--DECEMBER PART II--MAY	PHYSICIAN ASSESSMENT OF STUDENT PERFORMANCE PHYSICAL EXAMINATION SKILLS MASTERY VIDEOTAPES WRITTEN EXAM	PATIENT WRITE-UPS VIDEOTAPES TUTOR ASSESSMENT OF STUDENT PERFORMANCE	PHYSICIAN ASSESSMENTS OF STUDENT PERFORMANCE	
		NATIONAL BOARD OF MEDICAL EXAMINERS PART I		NATIONAL BOARD OF MEDICAL EXAMINERS PART II	

afternoon experiences. Mornings are spent in lecture or laboratory experiences. Afternoons are spent in clinical activities. During Phase II, the students have lectures in statistics and epidemiology during the morning. The afternoons are spent in the data base experience.

Data base is the introduction to history taking and physical examination skills. The students actually engage in practicing these skills working with senior citizens and other students. The skills taught in data base will be used throughout a physician's career.

The Phase III portion of the M-2 year is approximately thirty weeks long. The morning lecture/laboratory experiences include pathophysiology, pathology, pharmacology, sociomedicine, and epidemiology. Data base continues in the afternoons with the addition of the tutorial course.

Students meet in tutorial groups which consists of five students and a physician tutor. Throughout the year, the students will meet in several different tutorial groups. This allows different students to work together and introduces the students to different physicians. The tutorials reflect the morning program in the clinical problems discussed. The pathophysiology course determines the order of problem consideration for all of the other courses in Phase III. Therefore, when the pathophysiology course examines cardiovascular problems, the other courses also deal with relevant aspects of cardiovascular problems. The other problems considered throughout the course include endocrinology, rheumatology, hematology, oncology, psychiatry, pulmonary, renal, gastrointestinal, and infectious diseases.

In tutorials, students present patient histories to the rest of their tutorial group for discussion and clarification of issues. The tutorials require that each student visit two hospitalized patients per week and complete patient histories and perform physical examinations. In this manner, the data base skills are refined. Early in the tutorial experiences, students may spend as long as eight hours gathering a single patient's history and completing the physical examination. The patient selected is linked to the problem being considered in pathophysiology.

In the morning curriculum, assessment of student progress is by written examination. In the afternoon curriculum, the assessment focuses on skill mastery and demonstration of clinical understanding. Mastery of data base is determined by a senior physician's assessment of the student's performance. The student must demonstrate physical examination skills appropriate for each clinical problem under consideration. The student is videotaped performing the physical examination techniques and taking the patient's health history. This provides an opportunity to review techniques and discuss interpersonal skills. Students are given written examinations on portions of the data base. Assessment of student performance in tutorials is achieved through several methods. For each patient the student examines in the clinical setting, the student produces a document known as a patient write-up. In this report, the student presents all that was learned concerning the patient's previous health history. The patient's current problems are presented. Tests and x-rays that have been completed are indicated. This write-up is the core of the information presented in the tutorial meeting. Each student presents write-ups for two patients each week.

The tutorials are videotaped. This provides another evaluative tool for the students and tutor. Part of the emphasis of the tutorials is teaching a method of learning from one's colleagues. This is done through the sharing of these patient histories and the questions that arise as different clinical problems are discussed.

At the conclusion of each tutorial rotation, the tutor completes a comprehensive assessment form for each student in the tutorial group. Each student completes an assessment of the tutor's performance as well.

Table 2
GENERIC

	M-1 PHASE I		M-2 PHASE II PHASE III		M-3 PHASE IV M-4	
	BASIC SCIENCE		CLINICAL INTRODUCTION		CLERKSHIPS	
I N S T R U C T I O N	DIDACTIC		DIDACTIC		CLINICAL	
	CLINICAL		CLINICAL			
S T U D E N T E V A L U A T I O N	STUDENT EVALUATION		STUDENT EVALUATION		STUDENT EVALUATION	
	FORMAL		FORMAL		FORMAL	
			INFORMAL		INFORMAL	
	INFORMAL		EXTERNAL		EXTERNAL	

Before the student can begin the clerkship years, the student must take the examination known as the National Board of Medical Examiners Part I. This is a form of external evaluation.

M-3 and M-4 Years

Years three and four constitute Phase IV or the clerkships. The students participate in required clerkships as well as elective/selective clerkship experiences for a total of sixty (60) weeks. The individual clerkships vary in length based on specialty. Some clerkships are as short as four weeks; others are as long as twelve weeks. Students are advised to begin their clerkships with twelve weeks of Internal Medicine and to end their clerkships with another twelve weeks of Internal Medicine. The clerkships are exclusively clinical experiences. Clerks spend their time in the clinical setting performing duties as assigned by the senior specialist. The experience is shaped entirely by the senior professionals.

The student is evaluated at the conclusion of each clerkship by the physician who directs the clerkship. This assessment carries significant importance because it reflects the student's application of knowledge and skills acquired in years one and two. To graduate, the student must complete an individual study project. Graduates must also take a college senior certifying examination. Additionally, the National Board of Medical Examiners Part II must be taken.

General Principles

There are some over-arching philosophical principles present in this curriculum that are not conveyed in the diagrammatic descriptions. A first principle is that although content is important, the profession requires skill in learning a method of finding solutions to problems. Therefore, the core of the method is problem-solving (Barrows, 1985; Case, 1985).

A second principle is that the information/knowledge base is changing so dramatically that there is no hope of learning what is needed for the length of a professional career. Therefore, the emphasis is on continuous or continuing medical education (Case, 1985; GPEP, 1984; Soder; Shapiro, 1988; Soder, 1988; Weinholtz, 1985).

A third point is that physicians gain a great deal of current information and advice from their colleagues on a daily basis. Therefore, this style of "learning on the job" is fostered in the clinical introduction through data base and tutorials. This emphasis is perfected throughout the clerkship years and is further developed in the physician's residency after graduation (Case, 1985; Daedalus, 1986; Doyle, 1985; Shapiro, 1988; Soder, 1988).

A Generic View

The utility of an examination of this medical school curriculum becomes more apparent when the information contained in Table 1 is distilled to what can be called a generic version of the information. (Table 2).

The M-1 year in this format reveals a heavy content or didactic emphasis. Learning experiences are directed by the lecturer. Emphasis on knowledge acquisition and information transmittal dominate. The method is primarily lecture. Clinical experience is very limited. Evaluation is primarily formal.

In the M-2 year, the method becomes half didactic or lecture style and half clinical or practice related. In the clinical aspects, learning experiences are determined by a patient's complaint. Evaluation of didactic experiences is formal. Evaluation of the clinical experiences is more informal. For the clinical experiences, the senior professional assesses students individually based on student mastery of skill, patient presentations,

and ability to ask appropriate questions related to patient complaints. The M-2 year heralds the arrival of an external form of evaluation.

During the clerkship years, the student assumes a much more active role as confidence grows and skills improve. Informal evaluation dominates. The young professional is called upon to demonstrate knowledge and skill at a patient's bedside. The senior professional requests this information often in the presence of peers and other health professionals. The senior professional's assessment of the student's ability stems from these experiences. A limited formal evaluation precedes graduation as does an external evaluation measure.

This generic model shows an early emphasis on didactics that later is replaced by a total emphasis on clinical experience. Similarly, the evaluation of early performance is measured by formal assessment tools. In the practice-oriented phase, evaluation becomes informal. Students are obliged to meet the expectations of a constantly changing array of professionals.

By simplifying the process of educating medical professionals to these generic concepts, some preliminary analogies can be made for the field of education. One caveat, however, is that students entering medical school have generally completed a bachelor's degree. This is only the case for graduate students in education.

Professional Training Programs Compared

In order to envision this medical model as it might pertain to an education student, the curriculum presented must be viewed as representing professional preparation. Therefore, the comparison has to be between one professional program and another. For undergraduate education students, with the exception of five-year degree plan students, the professional experiences are limited to essentially two of the four years of the degree plan.

In the early portions of the professional training programs for both fields, a heavy emphasis is placed on knowledge acquisition or content, didactic aspects. The subject areas for medicine have been listed. For undergraduate education students the focus would be courses such as: educational foundations; philosophy; psychology; methods. Similar analogies could be drawn for those graduate programs that have both didactic and clinical components such as special education and education administration.

The later experiences in both fields are practice-oriented. In education, one notes this in the student teaching experiences. More innovative undergraduate education programs infuse practical experiences in the curriculum as early as possible. These early field experiences are identified by a wide variety of terms. Their intent is to place students in the field as early and as often as possible to enable students to have a better understanding of the profession. In medicine, the earliest formal exposure is through the M.D.A. experience.

There is a very critical difference between the clinical experiences offered to the fledgling medical student and the student of education. A medical student's clinical training takes place at the hands of a great number of senior professionals. This practical training is monitored and influenced by all the senior professionals who work in the clinic or hospital at which the student trains. Although department heads have administrative responsibilities for the student's progress, the other professionals accept the junior professional as an "on-the-job learner." They all work collectively to provide learning opportunities and to offer guidance as necessary. In this setting, the medical student has a never-ending series of role models. There is also a clear understanding that there are many different ways of solving medical problems. There is

not just one best way. This is reinforced by the setting in which the student learns. There are many physicians working to achieve the same goal using a number of different styles, techniques, treatments to arrive at the ideal of patient wellness. There is no drive or push to use just one approach or method as the panacea for a specific ill. There is a tacit understanding that there is a vast array of methods that can be used to solve exceptionally complex problems. The personalities of the physician, the situations, and the multitude of other factors make an open systems approach to problem solving seem only natural.

This approach is in stark contrast to the method of preparing educators. The young educator is assigned to A classroom or A cooperating teacher. This reflects the configuration of the schools in general. Teachers are compartmentalized. They are sent to their individual classrooms to work in isolation and loneliness from the first day of school to the last. Although experimental designs have been tried in many districts, the return to the norm has been the dominate pattern. The notion of one teacher/one classroom has been embedded in the educator's professional psyche. This notion, then, is perpetuated in the preparation of young teachers. This would appear to be a limiting feature in the preparation of educators. Although student teachers may have the opportunity to observe a number of different classrooms, there is a vast difference between observing in a number of different settings and teaching in a number of different settings.

The young medical professional must demonstrate skill and understandings at the side of the senior professionals. This is not just at the side of one professional or a few professionals. The abilities are demonstrated before a large number of senior members.

Student teachers perform for one or very few experienced teachers. Perhaps this is a serious flaw in education programs. There are a great number of outstanding, experienced teachers. Teachers in preparation programs see only a few examples of outstanding teaching. The number of role models young teachers work with is limited. The opportunity to learn from a number of different approaches to problem solving is missing. By preparing educators in isolation, the isolated aspect of the education profession is reinforced.

As mentioned earlier, a great deal of information is shared by medical professionals on the job. These collegial interactions deal with new methods, new ideas, current dilemmas. Early in their preparation, medical professionals learn to formulate a problem list. In the tutorial groups, the students begin to learn to discuss the problem list. Essentially this procedure continues throughout the physician's professional life. While the physician works with his/her patients, there are opportunities for discussion of problems with other professionals. These informal exchanges are concerned with problem solving. There is no hint of inability or ignorance on the part of the physician. These interchanges are problem-oriented, not personal-competence oriented.

In education, the problem-oriented discussions seem to arise only in time of crisis. The configuration of the workplace in education does not encourage informal discussions between professionals. Planning periods or lunch periods are the lone opportunities. Often these are not appropriate times for such a discussion. The individuals scheduled together at planning or lunch times may not be appropriate individuals for a problem discussion. Essentially the message to the young teacher is to "work it out independently." To call for help is often viewed as a sign of weakness or incapacity. Therefore the task of the young teacher is to independently learn the various aspects of being an educator in isolation from experienced elders. By

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promoting this approach to learning and teaching in isolation, the educator is forced to invent the wheel over and over again. It is unfortunate that it is viewed as a mark of failure to call for help or advice.

Every educator has an arsenal of techniques and experiences. The experienced professional can point to successes and failures in a constantly changing number of situations with a wide variety of students. These experiences are lost to the junior professionals in education. The junior professional receives a very minute fragment of that store of experience. In essence, the young teacher is forced to repeat mistakes of the past. Therefore, in its clinical dimensions, education does not strive to synthesize the experiences of its senior professionals in its training programs. Instead, each new teacher begins at the point at which every other new teacher begins. The lessons of the past only compound from cooperating teacher to student teacher. They do not compound from all social studies teachers in this building to the student teacher. The ratio, then, is one cooperating teacher preparing one new teacher (1:1). The ratio does not become 20:1. Twenty senior teachers do not prepare the one new teacher.

As the medical student is prepared by the members of the profession, the student is called on to demonstrate skills and understanding at a patient's bedside. This dimension encourages medical students to develop a keen interest in a patient's problems. Perhaps this should be referred to as the performance anxiety dimension. This dimension is evident in student teachers also. This stimulates the student to high levels of accomplishment. The performance anxiety dimension would remain present throughout the student teaching experience if the observing parties would change frequently. Rather than meeting solely the expectations of the lone cooperating teacher, the student teacher could be evaluated and coached by a larger number of senior teachers. This would permit a greater sharing of experiential learning by the senior education profession.

Characteristics of a Profession

Perhaps a key issue in comparing the two fields is an understanding of how the concept of a profession is viewed in each field. For the purposes of this comparison, five aspects of a profession are important. First of all, a profession has an organized body of knowledge. Professionals police their own membership, set their own standards. There is a means of enforcing the "rules" of the profession. Professionals continue to advance their knowledge of the field throughout their careers. Professionals have autonomy.

For medicine, the body of knowledge called the basic sciences could be identified. Coupled with the skills taught in data base and a problem-solving orientation, the medical student is given the profession's foundation.

In education, one can identify the previously mentioned courses: foundations of education; philosophy of education; educational psychology; and methods. For skills, one could cite the student teaching experience. One can also cite the discussion that ensues concerning whether educators can really identify a true core of professional knowledge.

Medicine has been very wary of opening the doors of medical schools to all would-be participants. There has been a concerted effort on the part of the profession to establish highly selective admissions standards. Medical school aspirants recognize the importance of high grade point averages and excellent scores on the Medical College Aptitude Test early in life. Students approach admissions having shown successful completion of a very rigorous curriculum generally in the basic sciences. To graduate, students must successfully pass both comprehensive examinations and the National Board of Medical Examiners tests

Parts I & II. The students must demonstrate their mastery of the various clinical skills to the satisfaction of a variety of clinicians.

In education, the grade point average hardly compares with the medical requirement. Examinations for admission to education programs are being adopted. Perhaps one could point to the Pre-Professional Skills Test as such an admissions requirement. Some schools of education and state departments of education require the National Teachers Examination for graduation or certification. The testing emphasis varies from state to state. For skill mastery, the student must satisfy the cooperating teacher and the university supervisor. Although education continues to strive for excellence in its preparation programs, there is a clear gulf between the rigors of medicine and the rigors of education.

In enforcing its rules, the American Medical Association is evident. State medical societies, county medical societies, and specialty organizations are very active in "rules" setting and interpretation. The membership of these groups is composed of physicians.

In education, one notes the existence of the National Education Association and the American Federation of Teachers. However, one is also aware of other groups who influence the "rules" in education. State departments of education, administrator groups, boards of education also are active in the determination of the rules. In comparing the rule setting bodies, one notes that in medicine the physicians are all peers or equals. This is not the case in education. Teachers and superintendents are not peers or equals in a school district. This analogy could be expanded to include a number of other examples.

In medicine, the burgeoning information in the field makes continuing education essential. Physicians attend many meetings dealing with advances in their field. Participation in such activities is an expected part of the physician's role.

For the educator, meeting attendance is often determined by district administrators. The opportunities and meeting topics are often determined without assessing the needs of the educators. Because the choices an educator is permitted to make concerning these learning experiences are limited, participation is often reluctant.

The physician has a considerable amount of autonomy in designing the nature of his or her work. The choices available to a physician exist in: the management of a patient's care; the type of practice selected (private, group, clinic, hospital, research, teaching); selection of an area of specialty; and decision-making opportunities.

For the educator, the opportunities for autonomy focus on selection of methodologies for teaching within a classroom. The individual teachers in a school have limited opportunities to exercise autonomy. Administrators in educational settings have greater opportunities for autonomy than do teachers.

The comparison of the professions could be expanded on a number of dimensions. However, the intention is not to be exhaustive but to point to different opportunities for the improvement of the education profession.

IMPLICATIONS FOR THE TRAINING OF EDUCATORS

In reviewing the two programs, one has to acknowledge the phenomena whereby one constantly encounters individuals who "used to be" teachers. This is a prevalent condition for education. In the long run, this may be best for the students and for education. However, it raises some questions about the resources invested in preparing those individuals. It also causes one to wonder whether education is simply the modern equivalent of a liberal arts education.

Is education attractive because it is so versatile? Education, then, becomes a good foundation for a number of different career paths. It is easy to get into and even easier to leave. In general, education is seen as an all inclusive rather than an exclusive field of study. This could be summarized as the revolving door view of education.

Is education viewed as a profession by those who begin their studies in the field? Do students beginning their studies in education intend to commit their lifetime career to the profession?

Students beginning their medical studies are making a lifetime commitment. Once students have met the medical school admissions requirements, the students' career path is set. The only alterations in the path will be specialty selections. Think of it this way. When was the last time you met someone who used to be a physician but is now selling insurance for a living?

In addition to the "revolving door syndrome" in the education profession, one might also consider the key issue of responsibility. In the medical profession, the physician's responsibility is very clear. The doctor is responsible for a patient's life.

It would seem entirely appropriate for educators to examine the importance of their responsibility. How is this issue presented to students in preparation and to the public? The responsibility an educator assumes is very significant. It would only enhance the profession as a whole if the profession's commitment to this responsibility was made known to all.

Medical preparation offers the following ideas for educators. First of all, professional preparation should not occur in isolation but at the side of a vast array of professionals. Assessment of performance conducted by a number of different members of the profession helps to shape the junior professional.

The issues of commitment and responsibility are apparent in the training of medical professionals. Can education elicit similar commitment from its ranks? Can the profession speak more directly to its responsibility?

The clinical component of medicine dominates. The clinical experience is linked to rigorous standards of technique mastery. In education, the linkage of clinical rigor and professional responsibility should be a natural relationship.

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